CLAIMS

1. Method for measuring the binding of analyte molecules to probe molecules, the method comprising the following steps:
(a) providing a circuit surface with electronic circuits,
(b) providing areas with covalently bound probe molecules, located in spatial proximity to the electronic circuits,
(c) binding analyte molecules to the probe molecules and, together with the analyte molecules, electrically conductive nanoparticles, and
(d) making the circuits of the circuit surface electrically reading the presence of the nanoparticles and thereby detecting the binding of the analyte molecules.

2. Method according to Claim 1, wherein the reading by a circuit in step (d) consists of reading the changed stray capacitance near the circuit.

3. Method according to Claim 1, wherein the reading by a circuit in step (d) consists of reading a voltage on the nanoparticles after contacting the nanoparticles to a contact spot of the circuit.

4. Method according to Claim 1, wherein the probe molecules are bound to areas of the circuit surface in spatial proximity to the electronic circuits.

5. Method according to Claim 1, wherein the probe molecules are bound to areas in spatial proximity to the electronic circuits, the areas located on the surface of a countersurface, positioned opposite the circuit surface.

6. Method according to Claim 1, wherein the probe molecules are covalently bound to the surface and, in step (c), the analyte molecules are affinity bound to the probe molecules.

7. Method according to Claim 1, wherein the nanoparticles are already bound to the analyte molecules.

8. Method according to Claim 1, wherein in a first part of step (c), analyte molecules are bound to surface-bound probe molecules and in a second part of step (c), nanoparticles with adhesion molecules fixed to them are attached to the bound analyte molecules.

9. Method according to Claim 3, wherein the nanoparticles are pressed against a contact spot of the circuit by a movement of the countersurface, and wherein a voltage applied to the countersurface can be measured via the nanoparticles in the circuits of the circuit surface.

10. Method according to Claim 3, wherein a galvanic element is created by the metal surface of the bound nanoparticles, by a metal counterelectrode spot of limited size on the circuit and by a suitable electrolyte, which, by contact of the nanoparticles with contact spots separated from the counterelectrode spots, generates an electric current in the circuit surface from the contact spots towards the counterelectrode spots, enabling the binding of analyte molecules to be measured.

11. Method according to Claim 10, wherein the contact between nanoparticles and contact spot is made by electrically conductive molecules.

12. Method according to Claim 11, wherein the electrically conductive molecules are compounds of the polyene class.

13. Method according to Claim 9, wherein the contact is made by the nanoparticles touching the contact spot.

14. Method according to Claim 13, wherein analyte molecules and nanoparticles are bound to probe molecules located on an insulating surface opposite the circuit surface, and the contact of the nanoparticles with the contact spots is made by pressing the insulating surface with the bound nanoparticles onto the contact spots of the circuit surface.

15. Method according to Claim 13, wherein analyte molecules and magnetizable nanoparticles are bound to probe molecules located on a surface opposite the circuit surface; the linkages between nanoparticles and analyte molecules or the linkages between the analyte molecules and the probe molecules are broken; and the contact of the now no longer immobilized nanoparticles with the contact spots of the circuit surface is made by an external magnetic field acting on the nanoparticles.

16. Method according to Claim 13, wherein analyte molecules and magnetizable nanoparticles are bound to probe molecules located on the contact spots of the circuit surface, and the contact of the nanoparticles with the contact spots is made by the effect of an external magnetic field or by mechanical pressure of a countersurface on the nanoparticles.

17. Method according to Claim 13, wherein the circuit surface or the surface of the nanoparticles is loaded with electrically conductive protrusions.

18. Method according to Claim 1, wherein DNA oligomers are used as probe molecules, the analyte molecules are amplified in a previous step by polymerase chain reactions (PCR) using a biotinylated primer, and the nanoparticles are bound to the biotin groups of the analyte molecules by being coated with streptavidin.

19. Method according to Claim 18, wherein instead of the biotin-streptavidin binding pair another binding pair is used.